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EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC.

ROCKY FLATS PLANT, P.O. BOX 464, GOLDEN, COLORADO 80402-0464 • (303) 966-7000

August 19, 1994

94-RF-08689

F. R. Lockhart

**Environmental Restoration Division** 

DOE, RFFO

LETTER OF TRANSMITTAL: RESPONSES TO CITIZENS ADVISORY BOARD

QUESTIONS - SRK-177-94

Action: None Required

Attached is a copy of the Responses to Citizens Advisory Board Questions. These

responses include informal review by your staff.

If you have any questions, please contact Andy Ledford, extension 8673.

S. R. Keith Program Manager Solar Pond Projects

- JAL:pjm

Orig. and 1 cc-F. R. Lockhart

Attachment: As Stated

CC: S. S.

IXIX

Howard Surovchak DOE, RFFO

M. A. Witherill

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RF-46469 (Rev. 6/94)

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ADMIN RECORD

# Responses to Citizens Advisory Board Questions

Resulting from Presentation of Solar Ponds Closure August 5, 1994

Respondent: J. A. Ledford, EG&G Rocky Flats, Inc.

Date: August 11, 1994

#### Questioner: Thomas P. Gallegos

- Q.1. Why was a standard landfill liner not planned? A cap has never been built that will not leak. By capping the ponds, this will not eliminate the generation of leachate from the contained materials. Therefore, there will continue to be impact to the groundwater for some time.
- A.1. It is true that all caps demonstrate water infiltration rates that are greater than zero, meaning that a small amount of water will, over a very long period of time, get through the cap. It is also true that the proposed solution presents a number of provisions which specifically address and mitigate the effects of infiltration. First, the cap is designed with a life expectancy of more than 1000 years. A consequence of that requirement is that no synthetic materials will be used in its construction because such material would be subject to decomposition and failure.

Infiltration control in the cap is therefore dependent upon mechanisms other than those used in "conventional" covers. Instead of utilizing clays (which, although not synthetic, are not suitable for use due to potential for desiccation in Colorado's semi-arid environment) and plastic sheets, the proposed cover takes advantage of natural evapo-transpiration of water from soil by plants. The top of the cap will be covered with a thick layer of soil planted with indigenous grasses. Thus, much of the precipitation that falls on the cap will be removed by the plants.

Water which escapes the plant roots will be inhibited from further downward migration by soil and gravel layers engineered to utilize capillary forces to block flow and a layer of rubberized bitumen (asphalt). The infiltration rate of the overall system is less than  $10^{-11}$  cm/sec which results in the soils beneath the cap being subjected to the equivalent of only 0.0148 inches of precipitation per year. Although this specific design is unique, it is based on research done at the DOE's Hanford facility over the last 5 years at a cost of \$25,000,000. Our design has been especially selected for durability and suitability to Colorado's semi-arid climate.

To be compliant with the requirement for 1000 year performance, a standard landfill liner, including its leachate collection system, would be required to demonstrate full performance, without human intervention, for that entire period. Since such liners are typically constructed of synthetic material (plastic), concerns were raised about their long-term durability and integrity. Plastic manufacturers cannot guarantee the integrity of their products for 1000 years. Concerns also exist regarding operability of a leachate collection system, which typically would depend upon pumps, other mechanical/electrical equipment, and humans, over the 1000 year period. Therefore,

the proposed solution does not include such a system, but instead accomplishes ground water protection through other means.

Finally, the infiltration rate has been thoroughly modeled, along with the potential for infiltrated water to mobilize contaminants contained in the wastes beneath the cap and the effects of those mobilized contaminants on the ground water system below the Solar Ponds. The results of those models show that the ground water is fully protected, as demonstrated by compliance with all ground water quality standards and all health-based remediation goals.

- Q.2. Where do CERCLA requirements fall with regard to the management of the ponds? Compliance with RCRA standards for caps was continually mentioned in the presentation.
- A.2. The proposed solution and the process for its development and implementation are fully compliant with all requirements of CERCLA. The effects of CERCLA, being more focused on clean-up of non-operational sites, can be more readily seen in the phases of the process concerned with assessment of the problem and selection of the best long-term solution to the problem. RCRA, being concerned largely with proper management of hazardous wastes and the facilities in which they are managed, influences the actions taken to ensure proper closure of the waste treatment and storage units at the ponds and proper management of the wastes intended to be left at the site. The cap is a hazardous waste site closure and management mechanism, and therefore is heavily influenced by RCRA. The Interagency Agreement (IAG), which governs the remediation of the ponds, brings the requirements of both laws to bear on all decisions and actions. Our proposed remedy meets the provisions of the IAG and the requirements of both laws.
- Q.3. The contaminants in the pond areas are not being directly addressed, but management of the general operable units is being achieved. Why is a more direct approach not being taken to deal with the contamination rather than landfilling the problem?
- A.3. Contamination is being directly addressed. First, an assessment of the nature and extent of contamination has been performed. Based on this assessment and an assessment of the human health effects of the contaminants identified, a determination was made concerning which areas of the operable unit required action for effective remediation. All contamination which exceeds levels requiring action will be removed and consolidated under the cap, which ensures isolation of those contaminants from the environment and protection of ground water for a period in excess of 1000 years. Isolation of the contaminants at the site is far more cost-effective than removal, packaging, shipping, and disposing at another facility (which would be a landfill), saving more than \$150,000,000 over such an approach, and is fully protective of human health and the environment.

<sup>1 100,000</sup> cubic yards of material X 27 cubic feet/cy X \$57/cf disposal cost = \$153,900,000

### Questioner: Chuck Clark

- Q.1. It was my understanding from the field trip I was on earlier this year, that the liners for the ponds would not meet RCRA compliance today. Does a RCRA closure require double liners under the contaminated materials, with leachate collection mechanisms for the future construction of the storage facility?
- A.1. Closure of a surface impoundment (the Solar Ponds are such impoundments) under RCRA does not require installation of double (or any) liners. The law does require that provisions be made such that any post-closure escape of contaminants, including leachate, is limited to an extent necessary to protect human health and the environment. The proposed cap, as described in the response to question Gallegos:Q.1 above, combined with the proposed lateral subsurface drain to prevent ground water infiltration of the wastes, easily achieve the requirements of the law and good practice and result in a fully protective closure.

#### Questioner: Joe Tempel

- Q.1. Can the contamination be put in a form that is more retrievable? i.e., in blocks, put in drums.
- A.1. Yes, the material could be placed in retrievable storage at considerable cost. The DOE prefers to solve the problem rather than delay action through storage for future disposal. At the present time, there is no requirement for retrievability, since the proposed remedy in intended to support, without modification, the final action. Once capped, the contamination is expected to remain in place permanently.
- Q.2. How will the disposal site be constructed and how will the dispersion of contaminants be prevented? i.e., cover the site with a portable structure
- A.2. Construction, as it relates to contaminated soils, consists primarily of excavation and placement of the soils and will proceed in a moving front across the site. In such a manner, the amount of contaminated soil exposed at any one time will be limited. Immediately upon completion of final placement in an area, a layer of clean material will be placed on the surface. When all soil placement is complete, construction of the cap will proceed with placement of various layers of uncontaminated material (from off site) until the final layer of clean soil is placed and vegetated. Contaminant dispersion will be prevented through minimization of contaminated soil exposed, immediate coverage with uncontaminated material, and dust suppression measures such as water sprays, stabilizing compounds, and protective tarpaulins. In addition, construction activities will be limited during periods of high winds.

#### Questioner: Steve Tarlton

Q.1. If have to have on-site disposal, is this the best place on site for a landfill? And does this site meet DOE criteria for landfills?

A.1. The site of the Solar Ponds presents a number of advantages with regard to selection of an appropriate location for disposition of the wastes. The site provides adequate capacity for all wastes when consolidated, no transportation of wastes (with attendant spillage and dispersion risks) to a distant site is required, and there is no need to contaminate another location. The Solar Ponds site presents no deficiencies which require extensive or expensive actions to address. In addition, the site is immediately available, which allows rapid commencement of the closure remedy. An alternate site could be expected to require full permitting as a true RCRA hazardous waste landfill which has been known to require up to 10 years in Colorado. No waste could be placed until the permitting process was complete, thereby significantly delaying action at OU4. All applicable Colorado regulations and DOE criteria will be met by the proposed action.

## Questioner: Jim Burch

- Q.1. What do the EPA/CDH think about this plan?
- A.1. EPA and CDPHE (CDH has recently changed its name) have different areas of agreement and reservation concerning details of the plan. Both agencies agree that the action proposed is, in general, fully effective and protective. The EPA is concerned that the level of protection afforded by the cap may be excessive and that, therefore, a less-rigorous alternative should be pursued. EPA is also considering utilization of a different ground water control mechanism than the one currently proposed. The CDPHE is concerned that disposition of pond sludge under the cap may not be acceptable even though such disposition can be demonstrated to be fully protective of human health and the environment. It should be noted that the two agencies have committed to fully and equally participate with the DOE in joint development of the plan for remediating OU4, and they have, for the past 11 months, conscientiously fulfilled this commitment. It is expected that, over the next few weeks, the agencies will continue in that commitment and will resolve, with the DOE, the few issues that remain. More specific questions should be addressed directly to EPA or CDPHE.
- Q.2. Do they have any issues?
- A.2. Yes. Please refer to the response to Question Burch: Q.1 above.

#### Questioner: Eugene DeMayo

- Q.1. What would the cost of an enclosed working area be? (used to reduce off-site contamination)
- A.1. The cost of enclosing the working area at OU4 has not been specifically determined. To date, the concept of an enclosed working area at the site has appeared impractical due to costs (both initial and impacts on productivity and schedule), health and safety concerns regarding exhausts of diesel-powered earth moving and compaction equipment operating within the enclosure, health and safety concerns regarding operation of large equipment in relatively restricted spaces, and the availability and effectiveness of inexpensive dust control measures. Instead, focus has been on

- developing detailed logistical plans to minimize the amount of contaminated soil exposed and to limit the time of exposure.
- Q.2. What is the estimated cost of removing all contaminants to storage vs. the proposed closure?
- A.2. The cost of excavating and disposing all of the contaminated material from the site at the only available mixed waste disposal facility in the United States would be in excess of \$150,000,000. Please refer to the response to Question Gallegos:Q.3 for further information.
- Q.3. What are the "disputes" with EPA/CDH?
- A.3. The DOE has invoked the dispute resolution process defined in the Interagency Agreement (IAG) twice during the last year. The process provides a mechanism for the DOE to appeal decisions made by the regulators with which the DOE does not agree. The appeal is made to dispute resolution committees comprised of members of the management of each of the three parties to the IAG (DOE, CDPHE, and EPA). Disputes can be referred to successively higher levels of management if they cannot be resolved at lower levels until ultimate resolution is found at the level of the Governor of the State of Colorado and the Cabinet level for the two Federal agencies.

DOE invoked the process in the summer of 1993 when the agencies would not grant DOE's requested extension of IAG milestones for submittal of the OU4 Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) Report. As part of the resolution of that dispute, the three parties agreed to a number of innovative modifications to the IAG administrative process which resulted in a 16-month acceleration of the Phase I remediation of OU4, as compared to the baseline IAG milestone.

The process was invoked again in the spring/summer of 1994 when the regulators denied DOE's request for milestone extensions due to the increased scope of disposition of pond sludge as part of the proposed Interim Measure/Interim Remedial Action (IM/IRA). That dispute has been formally resolved by the initial resolution committee, but a working group commissioned by the committee to resolve certain technical issues is still at work.

- Q.4. What monitoring for leaks is proposed and for how long?
- A.4. The proposed remedial action includes provision for incorporation of various types of instrumentation in the vadose zone soils beneath the cap and for installation of monitoring wells around the cap perimeter. The vadose zone monitors will detect water infiltration and will be able to differentiate expected and greater-than-expected rates. Detection of greater-than-expected infiltration, if it should occur, would serve as an early warning of a potential cap failure. Monitoring of the vadose instruments and the wells will continue for at least 30 years after closure.

- Q.5 What will happen when it leaks (it will eventually)?
- A.5. Infiltration of water through the cap is expected, at very low rates, and has been quantified through modeling. The effects of such infiltration has also been modeled, with results that demonstrate that human health and the environment are protected. The design is specifically intended to prevent catastrophic failure attributable to cracking of clay or synthetic materials which has occurred with other caps. Please refer to the response to Question Gallegos:Q.1 for additional information.
- Q.6. Is it true that this closure will preclude all other uses for the site? If not, what uses are suggested?
- A.6. Approximately 12 acres of OU4 (nominally at the site of the Solar Ponds) will be unsuitable for any future use other than open space or a green belt. The remaining 27 acres of Operable Unit 4 will be remediated to a condition suitable for future residential use, which would also allow commercial, industrial, recreational, or agricultural activities to be conducted.
- Q.7. How will the site be marked so that future generations are less likely to, unknowingly, dig up these wastes?
- A.7. The site of the cap will be fenced and marked with appropriate signs. Suitable notations and restrictions will be placed on the deed held by the Federal government. The land is currently owned by the Federal government, fee simple, and Federal land transfer regulations require certification prior to release.

#### Questioner: Ken Korkia

- Q.1. Will the entire inventory of backlog pondcrete be placed in the closure? Does it include the blocks that set up properly and were awaiting disposal at Nevada? Does it include pondcrete that did not set up properly and was awaiting refined treatment? Does it include the sludge that was recently removed from the ponds and is sitting in the portable tanks?
- A.1. All pondcrete currently on site at Rocky Flats would be candidate for disposition under the cap. There are no NTS-acceptable pondcrete packages. (Refined treatment of the pondcrete was planned to ensure 1000 lb/sf compressive strength, an NTS criteria. This performance is not needed or desired for disposition as part of the closure.) Pond sludge currently in storage tanks and in the ponds awaiting transfer to the tanks is also intended for disposition beneath the cap.
- Q.2. What contingencies are there if waste must be removed from the closure? What would be the costs of such a removal?
- A.2. The proposed approach does not provide for exhumation of waste since the remedy is part of the complete remediation of the unit. In the event of some situation that required removal of the wastes, materials under the cap and the cap itself could be excavated with conventional equipment. Costs of excavating the entire cap and the wastes beneath (a volume of approximately 300,000 cubic yards) would be on the

order of \$1,000,000, not considering costs of packaging and transporting the materials to another location or costs to refill the hole with clean material. If we assume the exhumation was performed so that the waste materials could be disposed at another facility, the costs would be increased by at least \$150,000,000 as presented in the response to Question Gallegos:Q.3.

#### Questioner: Lisa Hanson

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- Q.1. What decision/recommendation does the DOE want from the CAB?
- A.1. The DOE desires an objective assessment of the proposed remediation approach. The CAB represents the largest stakeholder group, the public. That group has not, until now, been part of the solution process; however, successful and timely implementation of the solution is dependent upon the public's understanding of the issues involved, upon sufficient opportunity for input so that a sense of public ownership of and commitment to the solution is developed, and upon the public's support of the approach that is proposed. The CAB can be highly effective in accomplishing this vital stakeholder involvement.
- Q.2. What decisions/recommendation do the regulators want from the CAB? i.e., EPA and CDPHE?
- A.2. The goals of the regulators parallel those of the DOE.

Thank you for your questions.